Amendments to the Specification:

Please replace the paragraph beginning at page 2, line 25 with the following amended paragraph:

-- According to one aspect of the present invention, there is provided [[a]] portable ~~instrument~~ apparatus for measuring parameters of optical signals propagating ~~bidirectionally~~ concurrently in opposite directions in an optical transmission path between ~~first and second~~ two elements, at least one of ~~which will not transmit its optical signals if continuity of the path is not maintained, the instrument comprising~~ the elements being operative to transmit a first optical signal (S1) only if it continues to receive a second optical signal (S2) from the other of said elements. The apparatus comprises first and second connector means for connecting the ~~instrument~~ apparatus into the optical transmission path in series therewith, and means connected between the first and second connector means for propagating at least said second optical signal (S2) towards said at least one of the elements, and measuring said parameters of said concurrently propagating optical signals (S1, S2). ~~coupler means having first and second ports connected to the first and second connector means, respectively, so that a path therebetween within the coupler completes the optical transmission path, a third port for outputting a portion of each optical signal received via the first port and a fourth port for outputting a portion of each optical signal received via the second port, detection means coupled to the third and fourth ports for converting the optical signal portions into corresponding electrical signals, processing means for processing the electrical signals to provide desired measurement values, and output means for indicating measurement results~~ --

Please insert the following new paragraphs before the paragraph beginning at page 3, line 8:

-- Where said one of the elements also receives via said optical transmission path a third optical signal (S3) at a different wavelength from that of said second optical signal (S2), the propagating and measuring means may further comprise means for measuring parameters of the third optical signal (S3).

The propagating and measuring means may provide an optical signal path between the first and second connector means for conveying at least a portion of said second optical signal (S2), therethrough for subsequent propagation to the respective one of the elements.

In embodiments of the invention which provide an optical path between the first and second connector means, the propagating and measuring means may comprise:

coupler means having first and second ports connected to the first and second connector means, respectively, and providing said optical signal path to convey a first portion to said first optical signal (S1) and second (S2) optical signal in opposite directions between said first and second connector means, the coupler means having a third port for outputting a second portion (S1') of said first optical signal (S1),

detection means for converting (at least) the portion of first optical signal portion into a corresponding electrical signal, and

measuring means for processing the electrical signal to provide an indication of said measured parameters

The coupler means may have a fourth port for outputting a portion of said second optical signal (S2), the detection means converting the second optical signal portion into a corresponding second electrical signal, and the measuring means processing both of the electrical signals to provide desired measurement values of parameters for each of the counter-propagating signals.

Where said one of the elements also normally receives via the optical transmission path a third optical signal (S3) at a different wavelength to that of said second optical signal (S2), the propagating and measuring means may further comprise means connected to the coupler means for splitting the corresponding optical signal portion into two parts, each part comprising portions of both the second and third optical signals, and separating the two parts according to wavelength before supplying same to said detection means. The detection means may then comprise separate detectors.

The means for splitting and separating may comprise a splitter connected to the coupler for splitting the optical signal portion into two parts and filter means for separating the two parts according to wavelength.

Alternatively, the means for splitting and separating may comprise a wavelength discriminator, for example a wavelength division multiplexer connected to the coupler means for separating the second and third optical signals (S2, S3) according to wavelength before supplying same to said detection means. --

Please replace the paragraph beginning at page 3, line 8 with the following amended paragraph:

-- ~~Preferably, the output means comprises~~ <u>The apparatus may comprise</u> display means for displaying measured values of the parameters. --

Please delete the paragraph beginning at page 3, line 10 and ending at page 3, line 16.

Please replace the two paragraphs beginning at page 4, line 1 and ending at page 4, line 19 with the following new paragraphs:

-- According to a second aspect of the invention, there is provided a method of measuring parameters of optical signals propagating concurrently in opposite directions in an optical transmission path between elements, at least one of the elements not transmitting its optical signals (S1) if it ceases to receive signals (S2) from the other of the elements, the method comprising the steps of (i) connecting into the optical transmission path first and second connectors of an apparatus for propagating at least

a portion of the second optical signal (S2) to the one element, (ii) extracting a portion of a said first optical signal (S1) and providing a corresponding first electrical signal; and (iii) processing said first electrical signal to provide desired parameter measurements.

The step of propagating at least a portion of the second signal (S2) may include the step of connecting coupler means into the optical transmission path so as to provide an optical path through the apparatus and extracting the portion of the second optical signal from a port of the coupler means.

Where at least one of the optical signal portions comprises parts having different wavelengths, the method may further comprise the step of distinguishing the corresponding different parts of the corresponding optical signal portion according to wavelength, and the detecting and measuring steps then may detect and measure the two different signal parts separately to provide the measured parameters for each signal.

The step of distinguishing the parts may be performed by splitting the portion of the optical signal into two parts and separating the two parts according to wavelength using, for example, filter means.

Alternatively, the step of distinguishing the parts may be performed using a wavelength discriminator, for example a wavelength division multiplexer.

Where the optical signals are analog, the measurement step may extract the time-averaged optical power of the signal.

Where the optical signals comprise bursts alternating with lulls, the measuring step may extract the optical power of the bursts.

If the optical signals comprise bursty digital signals, the measuring step may extract the optical power of the bursts averaged over the duration of the burst. More particularly, where the instrument is to be used for measuring power of optical signals comprised of "bursty" data streams (such as the ATM data signals), the measuring step may extract the power only from the data bursts and not from any intervening series of digital zeros (i.e. lack of signal). --

Please replace the paragraph beginning at page 5, line 2 with the following amended paragraph:

-- A portion of a passive optical network shown in Figure 1 comprises <u>a first element in the form of</u> a central office optical line terminal (OLT) 10 coupled by a 1:9 splitter 12 to a plurality of <u>other elements in the form of</u> optical network terminals (ONT) 14/1 to 14/9, each coupled to a respective one of the nine ports of the splitter 12 by one of a corresponding plurality of optical waveguides 16/1 to 16/9. (It should be noted that, although nine terminals and a nine-port splitter are shown for convenience of illustration, there could be more or fewer in practice.) The terminals use asynchronous transfer mode (ATM) or similar protocol to encode the downstream (OLT to ONTs) and upstream (ONTs to OLT) digital data signals. OLT 10 broadcasts to the ONTs 14/1 to 14/9 downstream data

signals (S2) at a wavelength of 1490-nm and downstream cable television (CATV) signals (S3) at a wavelength of 1550-nm and, in known manner, encodes the 1490-nm signals for synchronization purposes, the encoding being decoded by the ONTs and used to permit each of the ONTs 14/1 to 14/9 to send upstream, to the OLT 10, 1310-nm digital optical data signals (S1) in its own unique time slot so as to avoid interference with signals from other ONTs connected to the same OLT 10. The cable television signals (S3) are supplied by CATV source 11 shown connected to the OLT 10 and combined with the data signals (S2) in known manner. --

Please replace the paragraph beginning at page 5, line 23 with the following amended paragraph:

-- A test instrument 18 which allows the upstream and downstream optical signals to continue propagating, while measuring the power of the optical signals S1, S2 and S3 at all three wavelengths, will now be described with reference to Figure 2, which shows the instrument 18 connected into branch waveguide 16/9 between the splitter 12 and ONT 14/9. The test instrument 18 comprises a casing 20 having first 22 and second 24 bulkhead connector receptacles or ports shown coupled to the splitter 12 and ONT 14/9, respectively, connector receptacle 24 being connected to the ONT 14/9 by a short jumper 26. --

Please replace the paragraph beginning at page 6, line 4 with the following amended paragraph:

-- Thus, coupler 32 splits each of the signals S2, S3 and S1 ~~signal~~ received at ports 28 and 30, respectively, into two parts with a ratio of 80:20. The 80 per cent signal portions are each routed back to the other of the two connectors 22 and 24 while the 20 per cent signal portions S1' and S2', S3' are each routed to one of the corresponding third and fourth ports 34 and 36, respectively, of the coupler 32. --

Please replace the paragraph beginning at page 6, line 8 with the following amended paragraph:

-- Port 34, which receives the 20 per cent portion S1' of the signal S1 from the ONT 14/9, is connected by way of a filter 62, conveniently a 1310 nm bandpass filter, to a first photodetector 38 for detecting light at wavelengths nominally at 1310 nm. Port 36, which receives signal portions S2', S3' representing 20 per cent of each of the 1490-nm and 1550-nm optical signals from the OLT 10, is coupled to a 1x2 optical splitter 40, having an approximately 90:10 splitting ratio that is approximately the same at all downstream wavelengths to be measured (i.e. 1490 nm, 1550 nm). --

Please replace the paragraph beginning at page 6, line 15 with the following amended paragraph:

-- The 90 per cent signal portions S2" from splitter 40 are routed via the corresponding output optical fiber from the optical splitter 40 to a second bandpass filter 64, passing light within an

approximately 15-nm wavelength band centered about 1490 nm and substantially attenuating light outside of this band (e.g. attenuation of greater than 40 dB at 1550 nm for digital CATV signals). The output S''' of the second bandpass filter 64 is routed to a second photodetector 42, which detects light nominally at 1490 nm. --

Please replace the paragraph beginning at page 6, line 21 with the following amended paragraph:

-- The 10 per cent ~~signals~~ signal portions S2", S3" from splitter 40 are routed via the corresponding output optical fiber to a third bandpass filter 66, passing light within an approximately 25-nm wavelength band centered about approximately 1550 nm and substantially attenuating light outside of this band (e.g. greater than 20 dB for analog CATV signals, greater than 40 dB for digital CATV signals). The output S3''' of the third bandpass filter 66 is coupled to the third photodetector 44, which detects light nominally at 1550 nm. --

Please replace the paragraph beginning at page 6, line 28 with the following amended paragraph:

-- The three photodetectors 38, 42 and 44 supply their corresponding electrical signals to an electronic measuring ~~processing~~ unit 46 which comprises a set of three similar amplifiers 48, 50 and 52 for amplifying the electrical signals from photodetectors 38, 42 and 44, respectively. [[~~Peak~~]] Power detectors 54 and 56 detect (~~peak~~) power of the amplified electrical signals from amplifiers 48 and 50, respectively, and supply the (~~peak~~) power measurements to [[~~an~~]] a processor unit 58 which, using an internal analog-to-digital converter, converts them to corresponding digital signals which it processes to obtain the required parameter measurements, specifically power, and supplies the measurement information to a display unit 60 for display of the measurements in a conventional manner. The amplified signal from amplifier 52, corresponding to CATV signal S3, is supplied directly to the ~~processor~~ measurement unit 58~~, i.e., without peak detection,~~ to provide a measure of average optical power. --

Please replace the paragraph beginning at page 7, line 13 with the following amended paragraph:

-- While the [[~~cable~~]] link is disconnected, emission of the upstream data signals at wavelength 1310 nm by the ONT 14/9 will normally cease, and will then recommence when the two connectors are connected to their respective bulkhead connector receptacles 22,24 on the test instrument 18 and the ONT begins to receive the 1490 nm signal again. Measurements can then be taken. --

Please replace the paragraph beginning at page 7, line 20 with the following amended paragraph:

-- Once the test instrument is inserted into the line, between the splitter 12 and the selected one of the ONTs 14/1 to 14/9 (see Figure 1), 80% portions of the downstream data and video signals S2,S3

(i.e. [[~~e.g.~~]] at 1490 nm and 1550 nm, respectively) will pass directly through to the ONT 14/9. The ONT, thus synchronized via the received data signal, will then be able to emit its upstream ([[~~e.g.~~]] i.e. 1310-nm) data signal S1, an 80% portion of which will be sent upstream to the OLT 10, the other 20% portion being diverted to the detector 38. --

Please replace the paragraph beginning at page 8, line 1 with the following amended paragraph:

-- It will be appreciated that the invention is not limited to the measurement of optical power and to power meters, but could be applied to the measurement of other parameters, such as optical spectrum, bandwidth utilization in the transmission path or link, and so on. For example, the coupler 32 could be combined with an optical spectrum analyzer (OSA) which would replace the optical splitter 40, the bandpass filters 62, 64, 66, detectors 38, 42 and 44, ~~processing~~ measuring means 46, and the display 60, and a 2 x 1 coupler be added to couple the ports 34 and 36 of the 2 x 2 coupler 32 to the single input port of the OSA, thereby combining the two 20% signal portions. --

Please replace the paragraph beginning at page 8, line 19 with the following amended paragraph:

-- As illustrated in Figure 3, which shows part of a modified instrument 18*, the splitter 40 and bandpass filters 64 and 66 may be replaced by a wavelength demultiplexer 68 (e.g. a low optical crosstalk WDM coupler) which separates the ~~signals~~ signal portions S2' and S3' according to their respective wavelengths and supplies [[~~them~~]] the separated signals portions S2" and S3" to the detectors 42 and 44, respectively. It will be noted that Figure 3 omits the bandpass filter 62, but it may be included for the reasons discussed above. --